International Society for Biofabrication

ISBF Twitter Poster Conference

Join us on July 11th and 12th, post your scientific poster on Twitter, tag @ISBiofab, link your poster with the official hashtag of the event, and get in touch with colleagues from all over the world

3x Young Scientist Awards offered
To promote the best contributions

Registration Form, guidelines, info and Call for Awards
https://docs.google.com/forms/d/15mutyyaAFCn92XgkHlq8TfO3tliu9ndSdYuZXpai_BQ/edit

Abstract submission deadline: June 23th, 2023
Abstract acceptance notification: June 24-25th, 2023
The official hashtag will be shared before the beginning of the conference

Intl Soc Biofab
@ISBioFab

The @ISBioFab Twitter Poster Conference is back! Register now to participate in this exciting event with amazing awards to win 🤩🤩! @DalyAndyy @LindbergLabs @liliangouyang

1:06 AM · Jun 13, 2023 · 7,513 Views

11 Retweets 4 Quotes 27 Likes

Tweet your reply! Reply

Intl Soc Bi... @ISBi... · Jun 13
More ifnormation here ->

docs.google.com
ISBF 2023 Twitter Poster Conference

1 318

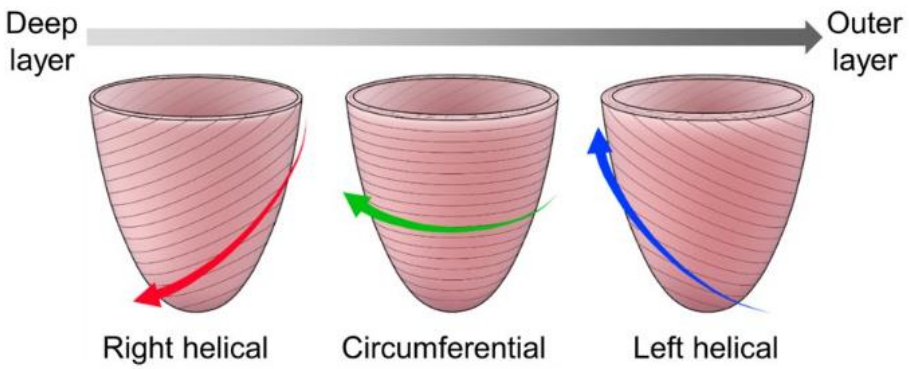
Left Ventricular Twisting Modeling by Generating Myocardial Fiber Orientation Using 3D Bioprinting-based Tissue Assembly

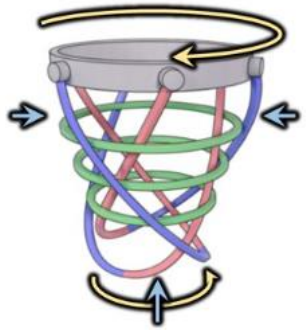
Dong Gyu Hwang[1], Hwanyong Choi[2], Uijung Yong[3], Donghwan Kim[1], and Jinah Jang[1,2,3,4*]

[1] School of Interdisciplinary Bioscience and Bioengineering, POSTECH, Republic of Korea
[2] Department of Mechanical Engineering, POSTECH, Republic of Korea
[3] Department of Convergence IT Engineering, POSTECH, Republic of Korea
[4] Institute for Convergence Research and Education in Advanced Technology, Yonsei University, Republic of Korea
* Corresponding author: jinahjang@postech.ac.kr

Abstract

Left ventricular twist (LVT) is a specific movement in which the apex and base rotate oppositely, maximizing chamber contraction. LVT is **caused by myocardial fiber orientation**, a gradual change of uniaxial myocardial fibers. In this study, we reported an LVT model by fabricating myocardial fiber orientation in a chamber-like structure using **3D bioprinting-based tissue assembly.**





Reproduction of Left ventricular twist

Acknowledgement

This research was supported by Korean Fund for Regenerative Medicine funded by Ministry of Science and ICT, and Ministry of Health and Welfare (**21A0104L1**), and supported by NRF grant funded by the Korean Government (**NRF-2019-Global Ph.D. Fellowship Program**).

2 20

Dong Gyu Hwang
@DG_HWNAG

Excited to share my research at the ongoing @ISBioFab twitter conference #Biofab2023. Reproducing left ventricular twist by mimicking myocardial fiber orientation in a chamber-like structure using 3D bioprinting-based tissue assembly.

10:55 PM · Jul 11, 2023 · **717** Views

View Tweet analytics

20 Likes

Tweet your reply! Reply

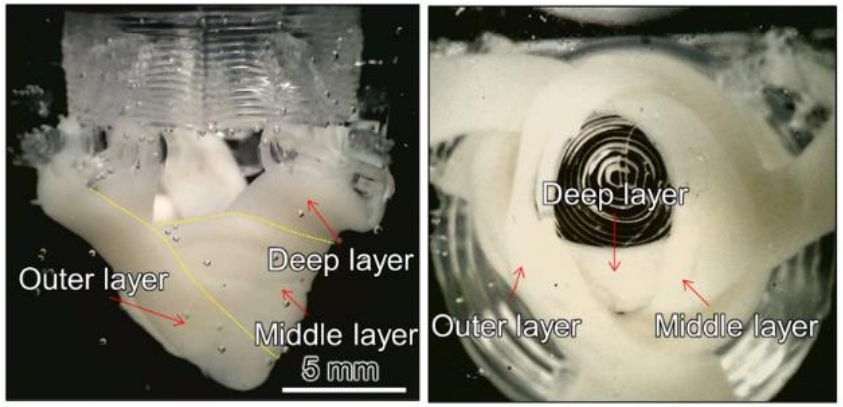
Gabriella Li... @Lind... · Jul 12
Very interesting results with oriented fibers for cardiac models @DG_HWNAG. What fiber properties (EHT module) would you say are key for successful assembly, and is it beneficial to pre-mature the fibers prior to the assembly process?

2 100

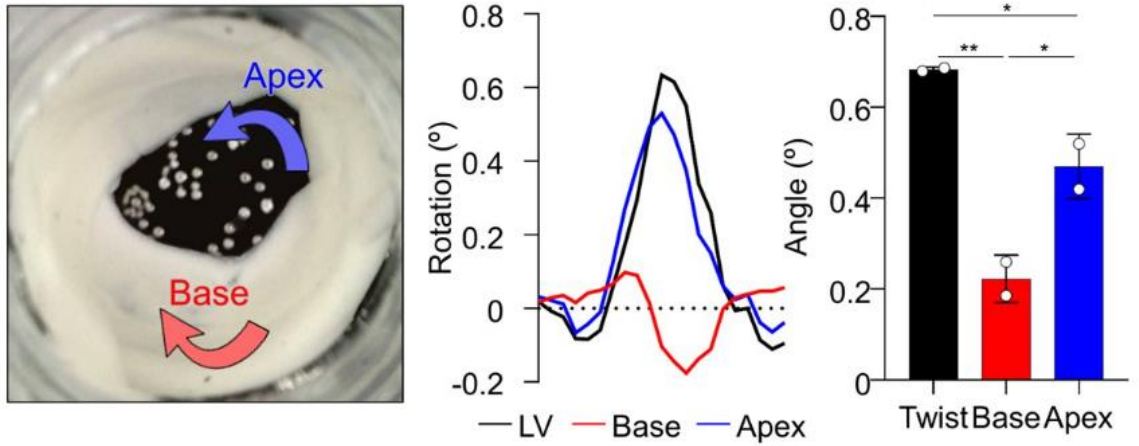
Dong Gyu ... @DG_H... · Jul 12
@LindbergLabs Thank you for your question! We pre-matured the fibers for about 5 days before assembly to induce sufficient structural and functional features. Also, physical contact and the presence of supportive cells are important factors for successful

Results (2/2)

a. Tissue assembly for mimicking myocardial fiber orientation



b. Assessment of left ventricular twist



Conclusions

- 3D bioprinting-based tissue assembly, a flexible hierarchical approach, was developed to mimicking myocardial fiber orientation of left ventricle.
- Uniaxial and functional engineered heart tissue was developed as a functional and structural building block.
- 3D bioprinting-based tissue assembly enabled control of cellular orientation and tissue synchronization.
- A Chamber-like structure with myocardial fiber orientation was fabricated using 3D bioprinting-based tissue assembly.
- The chamber-like structure exhibited a left ventricular twist with opposite rotation of apical and basal regions.
- Left ventricular twisting chamber-like structure can be used for drug testing and disease modeling that cause changes in twist.
- The 3D bioprinting-based tissue assembly can potentially be advanced for organ fabrication by creating tissue modules.

하이라이트

Dong Gyu Hwang
@DG_HWNAG

Excited to share my research at the ongoing @ISBioFab twitter conference #Biofab2023. Reproducing left ventricular twist by mimicking myocardial fiber orientation in a chamber-like structure using 3D bioprinting-based tissue assembly.

10:55 PM · Jul 11, 2023 · **717** Views

View Tweet analytics

20 Likes

Tweet your reply! Reply

Gabriella Li... @Lind... · Jul 12
Very interesting results with oriented fibers for cardiac models @DG_HWNAG. What fiber properties (EHT module) would you say are key for successful assembly, and is it beneficial to pre-mature the fibers prior to the assembly process?

2 100

Dong Gyu ... @DG_H... · Jul 12
@LindbergLabs Thank you for your question! We pre-matured the fibers for about 5 days before assembly to induce sufficient structural and functional features.